REMARKS

Claims 61-101 are withdrawn and Claims 102-151, species II are elected with traverse. Claims 61-151 remain in the application.

The Rejections:

In the Office Action dated January 11, 2008, the Examiner stated that newly submitted Claims 102-151 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: They are directed towards a new robot system, and not a paint/coating applicator system. The claims can be interpreted as species, whereas species I is Claims 61-101 which represent the generic robot and paint applicator embodiment and species II is Claims 102-151 which represent the no-waist robot and generic tool embodiment. The inventions as broken up can also be visualized as subcombinations usable together.

The Examiner further stated that since Applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, Claims 102-151 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

The Examiner rejected Claims 61, 63, 65, 67, 69-73, 77, 79-82, 86, 87, 89-92, 94-95, and 98-101 under 35 U.S.C. 103(a) as being unpatentable over Takeo (US Patent 4,721,630) in view of Yamamoto (US Patent 5,240,745) and either or both of Nuber (DE 101 19 906 Al) and/or Pearce (US 4,781,517).

As to Claim 72, Takeo discloses a modular apparatus for performing a process on an object having an upper surface and sides conveyed to and from a location, comprising a pair of frame rails (items 11, see Figure 1) extending on opposite sides of a location and generally parallel to a path of conveyance of an object through the location, at least one robot (items 5_1 and 5_2) mounted on an associated on of each of the frame rail, and a tool mounted on each of said at least one robot arms for performing a process on the object whereby the at least one robot arms move the tools relative to the object enabling the tools to perform processes on the objects. The robot arms are movable along the frame rail and pivotable at a shoulder axis. Takeo is capable of being modular.

The Examiner stated that Takeo does not disclose that there are at least two legs attached to each of the frame rails for supporting the frame rails above a plane of an upper surface of the object at the location, and at least one cross support member fixedly connecting the frame rails together to form a rigid structure with legs.

Yamamoto (especially with reference to Figure 15) discloses that it is known to elevate painting robots by placing them on cross support members (item 572) on elevated frame rails (item 518) mounted on legs (items 94a(b), 94c(d), and 38 - best seen in Figure 16). The cross support member connects the frame rails, forming a rigid structure with legs. One in the art would appreciate that elevated positioning would enable better coating of the roof of the car body, while still maintaining the capability of coating the sides of the car body. However, Yamamoto does not place the robots on the frame rails. Takeo does not place robots on both sides.

Both Pearce and Nuber disclose the concept of elevating a robot on frames, and placing a large portion of the robot underneath the frame.

Pearce discloses a modular apparatus with robots being extendable below the frame rails for performing a process on an object conveyed to and from a location comprising a pair of frame members (see Figure 2, which discloses a fixed frame and a single robot attached to the two fixed frames) extending on opposite sides of a location and general parallel to a path of conveyance of an object through the location, at least two legs (items 13, 18, 19 and 20 in Figure 2) attached to each of the frame rails for elevating the frame rails above a plane of an upper surface of the object at the location, at least one cross support member (item 23 in Figures 2) connecting the frame members together to form a rigid frame structure with the legs, at least one robot arm (items 71 and 114) mounted on an associated one of the frame members, and a tool mounted on the at least one robot arms for performing a process on the object whereby the at least one robot arms move the tools relative to the object enabling the tools to perform processes on the object. Pearce discloses, as shown in figure 2, that both frame rails are fixed as claimed, and at least one robot on the rails.

Similarly, Nuber discloses a frame or modular apparatus. Nuber's robot is specifically a paint spraying robot (item 13 is called a farbspritzroboter is German for paint spray robot, and item 14 is called a farbspritzpistole, which is German for paint

spray gun). The robot includes a fixed frame rail (which defines auxiliary axis 15, and along which the robot 14 moves) and fixed cross beams (rack 12). Additionally, the robot is a six-axis robot (column 3, lines 14-15 discloses that the robot 13 has "sechs aschen", German for six axis), and Figure 3 shows that the robot has a shoulder, elbow, and wrist below the auxiliary axis and the racks. From the position of the joints in Figure 3, both the shoulder and elbow permit movement only in a generally vertical plane.

Placing the robots on the frame rails in opposed configuration as in Pearce would enable symmetrical process of a car body and better processing or coating reach of the car roof as in Yamamoto. Raising the frame as in Nuber and lowering the robot below this frame improves access to the top surface of the substrate, and in the automobile field, would improve coating of the roof of the car. The cross support both Pearce, Nuber and Yamamoto would reduce the possibly of collapse by improving structural support.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized movable robots mounted on fixed elevated frame rails mounted on fix legs in order to provide better coating reach of the car roof and to have utilized a cross support in order to provide structural support.

As to Claims 73 and 77, the Examiner stated that Takeo discloses that each robot arm is a 6-axis robot with a wrist generally vertical planar operating space, and the wrist component being connected to the free end of the arm and the tool, the wrist component having 3 axes (column 6, lines 48-64).

As to Claims 79 and 80, the Examiner stated that Takeo discloses 6 axes of motion, including the four claimed, and the multiple axes of Takeo allow the shoulder axis to be offset as claimed.

As to Claim 61, the Examiner stated that Takeo, as modified by Yamamoto and Pearce and applied to Claim 1 above discusses the pair of frame rails mounted on opposite sides and extending generally parallel to the path of movement of the object (Takeo and Pearce), the frame rails being elevated above a plane of an upper surface of the object (see Pearce, Nuber and Yamamoto), the frame rails being connected together in a rigid frame structure (Pearce, Nuber and Yamamoto), at least one robot arm mounted on an associated one of each of said frame rails (Takeo), and that the robot arm is movable along the associated frame rail (Takeo, Nuber and Pearce), and that both frame

rails cannot move relative to each other, and both frame rails do not move relative to said frame (Pearce). Similarly, Nuber discloses that the shoulder and elbow permit movement only in a generally vertical plane from the position of the joints in Figure 3.

Takeo further discloses that each robot arm has at least two axes of motion for movement in a generally vertical plane transverse to the path of movement of the object (see column 6, lines 48-64), and these axes are considered to be shoulder and elbow axes. Takeo also further discloses that the tool is a paint applicator (bell type atomizers 5f) mounted on each of the at least one robot arms (items 51 and 52) and the arms move the paint applicators relative to the object while the paint applicators dispense paint to cover the upper surface and side surfaces of the object with paint.

As to Claim 81, the Examiner stated that Yamamoto as incorporated discloses generic control means (see Figures 14A, 14B, and 14C), which are capable of performing the claimed movements. Similarly, Nuber discloses that the shoulder and elbow permit movement only in a generally vertical plane from the position of the joints in Figure 3. Pearce and Nuber suggest raising the frame rails. Additionally, the apparatus of Takeo is capable of performing the functions as claimed.

As to Claim 63, the Examiner stated that the robots of Takeo, Yamamoto and Pearce are capable of moving as claimed.

As to Claims 65 and 86, the Examiner stated that Pearce and Nuber as incorporated discloses that the frame rails are mounted on floor engaging legs (see Pearce, Figure 2, Nuber, Figures 1-3).

As to Claims 67 and 87, the Examiner stated that Pearce discloses that the frame rails are connected by at least one cross support member elevated above the plane of the upper surface of the object.

As to Claim 69 and 82, the Examiner stated that both Pearce and Takeo disclose opposed symmetric robot designs. Takeo as incorporated discloses the capability of symmetric painting.

As to Claim 70, 71, 78 and 89, the Examiner stated that Takeo discloses 6 axes of motion, including the four claimed, and the multiple axes of Takeo allow the shoulder axis to be offset as claimed (column 6, lines 48-64).

The Examiner rejected Claims 90-95 and 97-101 based on the same rationale as

Claims 61, 63, 65, 67, 69-73, 77, 79-82, 86, 87 and 89 above. With respect especially to independent Claims 90 and 91, the Examiner stated that Takeo discloses first and second robot arms, and 6 axes of movement as well as rails on both sides. Yamamoto suggests raising them, and Pearce and Nuber suggest placing them on frames as claimed. See especially the rejection of claims 72, 61, and 81 above for independent claims 90 and 91.

Similarly, with respect to Claim 92, the Examiner stated that Nuber as applied discloses the claimed axes. As to claim 94, Takeo, Yamamoto and Nuber disclose paint applicators.

As to Claim 95, the Examiner stated that the robots of Takeo, Yamamoto and Nuber as modified can performed the claimed functions.

With respect to Claim 98, the Examiner stated that Takeo discloses the frame rails, and the robot arms, and the paint applicator. Takeo utilizes rotational axis (swinging, pivoting, etc) for the first and second links (see column 6). Yamamoto suggests raising the robots, and Nuber and Pearce suggest fully elevating the robots.

As to Claim 99, the Examiner stated that Pearce and Nuber suggest supporting guide rails on a frame. Additionally, Yamamoto and Takeo both disclose the multiple carriage and link system via the dual opposed robot approach.

As to Claim 100, the Examiner stated that Takeo discloses a 3-axis wrist (column 6, lines 48-64).

As to Claim 101, the Examiner stated that both Takeo and Nuber discloses fifth and six axes of rotation.

The Examiner rejected Claims 74, 83 and 97 under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto, Nuber and/or Pearce as applied to Claims 72, 81 and 91 above, and further in view of Thome (US Patent 5,744,190).

The Examiner stated that references as applied above are silent as to the robot arms including a process controller mounted for movement therewith along the associated frame rail.

However, as to Claims 72, 83 and 97, the Examiner stated that Thome discloses that it is known to include process controller (control systems 109a) within the robot bodies. Thome utilizes the process controllers in conjunction with sensors for robot feedback, and one in the art would appreciate that the close proximity of the control

device to the sensors reduces the amount of wiring needed between the process control and the sensor. Therefore, it would have been obvious to one of ordinary skill in the art to have utilized such process controls in order to reduce wiring between the robot feedback mechanism and the process control. Furthermore, such a placement would result in the system being mounted for movement along the associated frame rail in the context of the robots used in Takeo (as modified by Yamamoto and Pearce).

The Examiner rejected Claims 75, 88 and 96 under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto, Pearce and Thome as applied to claims 72, 81 and 91 above, and further in view of Cebola (US Patent 5,738,727).

As to Claims 75, 88 and 96, the Examiner stated that Takeo, Yamamoto, Pearce, and Thames as applied above do not disclose that the cross support member is tubular for receiving cables and conduits connecting the process controllers together.

According to the Examiner, Cebola discloses that it is known to make structural elements hollow or tubular for receiving cables and conduits connecting the process controllers together. Cebola discloses that shielding these cables protects from electrostatic fields and charges (see column 7, lines 37-45). Therefore, it would have been obvious to one of ordinary skill in the art to make cross beams and support elements tubular or hollow for receiving cables and conduits in order to protect the cables and conduits from electrostatic effects and charges.

The Examiner rejected Claim 76 under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto, Pearce and Thome as applied to Claims 75 and 52 above, and further in view of Neikter (US Patent 5,296,026).

The Examiner stated that Takeo, Yamamoto, Pearce, and Thorne as applied to Claim 75 above do not suggest that at least one cross support member is tubular and purged with an inert gas or air for explosion protection.

According to the Examiner, Neikter discloses that it is known for the cross support (item 20) to have a gas permeable tubular element (item 22) surrounding the cross support for generating a positive pressure (see column 4, lines 12-29). Neikter also discloses that the gas presented to the room can be an inert gas such as argon (see column 5, lines 10-17). One in the art would appreciate that this would protect the robots from explosion and prevent chemical interactions with the paint material. Therefore, it would have been

obvious to one of ordinary skill in the art at the time of the invention to have utilized cross supports which spread inert gas in order to protect the robots from explosion and prevent chemical interactions with the paint material.

The Examiner rejected Claims 64 and 85 under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto and Pearce as applied to Claims 61 and 81 above, and further in view of Josefsson (US Patent 5,766,355).

The Examiner stated that Takeo, Yamamoto, and Pearce as applied to Claims 61 and 81 above do not suggest that the frame rails are mounted on walls of a paint booth extending generally parallel to the path of movement. However, Takeo, Yamamoto, and Pearce have been applied to show the frame rails

According to the Examiner, Josefsson discloses that it is known to have painting robots mounted inside of a paint booth. Josefsson discloses that the use of such a paint booth confines the paint to the chamber, and facilitates collection of the paint overspray (see column 2, lines 40-61). Josefsson discloses that collection of the overspray in a paint booth allows for the later reapplication of the excess paint to subsequent automobiles (see column 3, lines 29- 43), which one in the art would immediately recognize as reducing material costs. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized a paint booth with walls (as in Josefsson) in conjunction with the frame rail robot design (of Takeo, Yamamoto and Pearce) in order to confine the paint overspray and facilitate paint re-use, thus reducing paint material costs.

The Examiner rejected Claims 66, and 68 under 35 U.S.C, 103(a) as being unpatentable over Takeo, Yamamoto and Pearce as applied to Claims 61 and 67 above, and further in view of Cebola (US Patent 5,738,727).

As to Claims 66 and 68, the Examiner stated that Takeo, Yamamoto, and Pearce as applied above does not disclose that either the frame rails are tubular, or the frame rail and cross support member are tubular.

According to the Examiner, Cebola discloses that it is known to make structural elements hollow or tubular for receiving cables and conduits connecting the process controllers together. Cebola discloses that shielding these cables protects from electrostatic fields and charges (see column 7, lines 37-45). Therefore, it would have

been obvious to one of ordinary skill in the art to make cross beams and support elements tubular or hollow for receiving cables and conduits in order to protect the cables and conduits from electrostatic effects and charges. Cebola as applied above discloses coupling conduits stored with the structural elements (see Figure 4, items 224 and other items).

The Examiner rejected Claims 62, 84 and 93 under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto, Pearce as applied to Claims 61 and 81 above, and further in view of Hohn et al (US Patent 4,896,274).

The Examiner stated that Takeo as applied does disclose a 6-axis robot with three of the axes being in a wrist mounting. Takeo, however, is silent as to the capabilities or movements of the 3-axis wrist mounting, and one would expect any conventional 3-axis wrist mounting to be used.

According to the Examiner, Hohn discloses a known 3-axis wrist mounting (item 27), for use in either adhesive application or paint spraying (column 3, line 36) in automobile industries, which is part of a larger, 6-axis robot, similar to that in Takeo. Take discloses two tilting axes (at pivot points 28 and 30), and a rotating axis (at point 32, as see column 3, line 65 to column 4, line 16 for discussion of the movements). Hohn recites that these three axes are intended to effect control over the orientation of the tool carried by the manipulator (or robot) with respect to a relocatable point of reference. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized a wrist having a rotating axis and a tilting axis as in Hohn in order to effect control over the orientation of the tool carried by the manipulator (or robot) with respect to a relocatable point of reference.

The Response:

In response to the restriction requirement, Applicant has withdrawn Claims 61-101, species I as designated by the Examiner, and elected Claims 102-151, species II with traverse.

In support of the restriction requirement, the Examiner made the following statements:

Claims 102-151 are directed towards a new robot system, and not a paint/coating applicator system;

Species I is Claims 61-101 which represent the generic robot and paint applicator embodiment; and

Species II is Claims 102-151 which represent a no-waist robot and generic tool embodiment.

The Examiner did not state that any of the claims are generic to both species.

Applicant respectfully disagrees with the Examiner's supporting statements for species I, Claims 61-101 and species II, Claims 102-151. Claims 61, 72, 81, 90, 91, 98, 102, 115, 127 and 140 are independent claims.

Claims 61-90, 94 and 95 recite a modular apparatus for painting including a paint applicator. However, Claims 91-93, 96 and 97 recite a modular apparatus for processing including process tool mounting means. Claims 98-101 recite a robot for processing including a process tool. Therefore, not all of the claims identified by the Examiner as being in species I "represent the generic robot and paint applicator embodiment".

Claims 102-151 recite a modular apparatus for performing a coating process including a tool for performing the coating process. Therefore, Claims 102-151 are directed towards "a paint/coating applicator system" and do not represent a "generic tool embodiment" as stated by the Examiner.

Applicant respectfully submits that Claims 102-151 are all directed to an apparatus for performing a coating process and include the elements of Claims 61-101.

Applicant refers the Examiner to the chart below which sets forth certain elements common to all of the claims and certain elements common to both species I and II as designated by the Examiner.

ELEMENT	SPECIES I	SPECIES II
A pair of frame rails	61, 72, 81, 90, 91, 98	102, 115, 127, 140
At least one robot arm associated with one of each of said frame rails	61, 72, 81, 90,	102, 115, 127, 140
A robot arm movable along said associated frame rail	61, 72, 81	102, 115, 127, 140
Said frame rails being elevated/located above a	61, 72, 81, 90, 91, 98	115, 140

plane		
Generic robot and paint applicator (as defined by Examiner)	61, 72, 81, 90	
No waist robot and generic tool (as defined by Examiner)	102, 115	

Note that there is no pattern to support a finding of two separate species. Neither independent Claim 91 nor independent Claim 98 of Species I recite a paint applicator. While both of these claims include a robot element, Claim 91 does not include a reference to an applicator of any form and Claim 98 includes a processing tool mounting means, but not a paint applicator. Similarly, Claims 102, 115, 127 and 140 of Species II claim a tool for performing a coating process, but neither independent Claim 127 nor independent Claim 140 of Species II recites a no waist robot.

All of the independent claims provide for a pair of frame rails. Both species contain claims including: at least one robot arm associated with one of each of said frame rails; a robot arm movable along said associated frame rail; and said frame rails being elevated/located above a plane.

Based on the above remarks, Applicant respectfully submits that all of the independent claims encompass the disclosed embodiments and overlap in scope. Applicant requests the Examiner to withdraw the election requirement.

The Examiner relies on Nuber (Nüßer DE 101 19 906 Al) to support the rejection under 35 U.S.C. 103(a) of independent Claims 61, 72, 81, 90, 91, and 98. Nuber has a publication date of October 24, 2002. Applicant claims priority to Provisional Application Serial No. 60/420,612 filed on October 23, 2002. Therefore, under 35 USC 102(e), Nuber is not prior art.

The Examiner rejected Claims 61, 63, 65, 67, 69-73, 77, 79-82, 86, 87, 89-92, 94-95, and 98-101 under 35 U.S.C. 103(a) as being unpatentable over Takeo (US Patent 4,721,630) in view of Yamamoto (US Patent 5,240,745) and either or both of Nuber and/or Pearce (US 4,781,517). While Nuber and Pearce were cited as being interchangeable, the Examiner relies **solely** on Nuber for disclosing a paint spraying six-axis robot including a fixed frame rail, fixed cross beams and the robot having a shoulder,

elbow and wrist below the auxiliary axis and racks permitting movement only in a generally vertical plane (Fig. 3). Additionally, the Examiner relies **solely** on Nuber to obviate raising the frame and lowering the robot below this frame to improve access to the top surface of the substrate, and in the automobile field, improve coating of the roof of the car. As set forth above, Nuber is not prior art. Thus, none of the independent claims in species I (currently withdrawn with traverse) are obvious in view of the remaining prior art where none of the art teaches a shoulder axis below the frame rail.

Applicant designated the status of the claims of species I as "withdrawn" and, in turn, the status of the claims of species II as "previously presented". With regard to the claims in species II, none of the art cited by the Examiner obviates these claims either. Applicant supports this finding where: Takeo discloses a floor mounted robotic system, Yamamoto discloses a paint booth having the robot system located on the floor and the paint spray guns located alongside and overhead of the conveyor (Figure 15) and Pearce teaches a well known gantry system.

As set forth in the interview summary of August 14, 2007, the inventors, along with the assignee, an attorney of record and the Examiner discussed the importance of the elimination of the waist axis in a robot, as well as elevation and positioning of robots as applied to Applicant's novel MODULAR PAINTING APPARATUS. One focus of the discussion was how to present a negative limitation, such as "a robot not having a waist axis." A review of the Manual of Patent Examining Procedures (MPEP) discloses the following relevant guidelines.

MPEP Section 2173.05(i) Negative Limitations

> The current view of the courts is that there is nothing inherently ambiguous or uncertain about a negative limitation. So long as the boundaries of the patent protection sought are set forth definitely, albeit negatively, the claim complies with the requirements of 35 U.S.C. 112, second paragraph. Some older cases were critical of negative limitations because they tended to define the invention in terms of what it was not, rather than pointing out the invention. Thus, the court observed that the limitation "R is an alkenyl radical other than 2-butenyl and 2,4-pentadienyl" was a negative limitation that rendered the claim indefinite because it was an attempt to claim the invention by excluding what the inventors did not invent rather than distinctly and particularly pointing out

what they did invent. *In re Schechter*, 205 F.2d 185, 98 USPQ 144 (CCPA 1953).

A claim which recited the limitation "said homopolymer being free from the proteins, soaps, resins, and sugars present in natural Hevea rubber" in order to exclude the characteristics of the prior art product, was considered definite because each recited limitation was definite. *In re Wakefield*, 422 F.2d 897, 899, 904, 164 USPQ 636, 638, 641 (CCPA 1970). In addition, the court found that the negative limitation "incapable of forming a dye with said oxidized developing agent" was definite because the boundaries of the patent protection sought were clear. *In re Barr*, 444 F.2d 588, 170 USPQ 330 (CCPA 1971).

Any negative limitation or exclusionary proviso must have basis in the original disclosure. If alternative elements are positively recited in the specification, they may be explicitly excluded in the claims. See *In re Johnson*, 558 F.2d 1008, 1019, 194 USPQ 187, 196 (CCPA 1977) ("[the] specification, having described the whole, necessarily described the part remaining."). See also *Ex parte Grasselli*, 231 USPQ 393 (Bd. App. 1983), *aff'd mem.*, 738 F.2d 453 (Fed. Cir. 1984). The mere absence of a positive recitation is not basis for an exclusion. Any claim containing a negative limitation which does not have basis in the original disclosure should be rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. Note that a lack of literal basis in the specification for a negative limitation may not be sufficient to establish a *prima facie* case for lack of descriptive support. *Ex parte Parks*, 30 USPQ2d 1234, 1236 (Bd. Pat. App. & Inter. 1993). See MPEP § 2163 - § 2163.07(b) for a discussion of the written description requirement of 35 U.S.C. 112, first paragraph.

Applicant respectfully submits that the presented independent Claims 102, 115, 127, and 140 follow the examples set forth in *In re Wakefield*, 422 F.2d 897, 899, 904, 164 USPQ 636, 638, 641 (CCPA 1970) and *In re Barr*, 444 F.2d 588, 170 USPQ 330 (CCPA 1971). Support for the negative limitation of no waist (Independent Claims 102 and 115) may be found in the specification at page 10, line 11. Support for the robot operating with at least three major axes (Independent Claims 127 and 140) and where the first axis is a linear axis and the second axis acts in a horizontal plane may be found in the specification at page 5, lines 3-5, page 8, lines 6-19 and Figure 5, reference numerals 34, 36, and 40- wherein the three axes: shoulder, elbow and rail- are the controlling axis, and the wrist axis 38 is an orientation axis.

In view of the above arguments, Applicant believes that all of the claims of record- both withdrawn and previously presented- define patentable subject matter over the art of record. Accordingly, an early Notice of Allowance is respectfully requested.